

## C L A I M S

1. A nitride semiconductor laser element characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and a 5 semiconductor layer of a second conductivity type, which are stacked one upon the other and each comprises a nitride; a striped waveguide region for a laser light provided on the semiconductor layer of the second conductivity type; and an insulative region for 10 reducing the capacitance of the element, wherein a pn-junction of the semiconductor layer at a peripheral region remote from the waveguide region is broken.

2. A nitride semiconductor laser element characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and 15 semiconductor layers of a second conductivity type, which are staked one upon the other and each comprises a nitride; a striped waveguide region for a laser light provided on the semiconductor layer of the second conductivity type; and an insulative region for 20 reducing the capacitance of the element having no depletion layer in the semiconductor layer at a peripheral region remote from the waveguide region.

3. The nitride semiconductor laser element 25 according to claim 1 or 2, wherein the insulative region for reducing the capacitance of the element is a region formed by implanting ions from the surface of

the semiconductor layer of the second conductivity type.

4. A nitride semiconductor laser element characterized by comprising: a substrate; a  
5 semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type, which are stacked on a main surface of the substrate and each comprises a nitride; a striped waveguide region for a laser light provided on  
10 the semiconductor layer of the second conductivity type; an embedded insulation film covering a side face of the waveguide region and a surface of the semiconductor layer of the second conductivity type; a first electrode in contact with a surface of the waveguide region; a protective insulation film covering at least a part of the embedded insulation film; a  
15 second electrode substantially connected to the semiconductor layer of the first conductivity type; and an insulative region for reducing the capacitance of the element, provided by converting at least a part of the semiconductor layer at a peripheral region remote from the waveguide region into a higher resistance one by ion implantation.  
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5. The nitride semiconductor laser element  
25 according to any one of claims 1 to 4, wherein the insulative region for reducing the capacitance of the element has an impurity peak concentration in the range

from  $1 \times 10^{18}$  to  $5 \times 10^{21}$  atms/cm<sup>3</sup>.

6. The nitride semiconductor laser element according to any one of claims 1 to 4, wherein the insulative region for reducing the capacitance of the element has a peak of distribution of the impurity concentration in the depth direction in the range from 5 200 nm to 1  $\mu$ m from the surface of the semiconductor layer of the second conductivity type.

7. The nitride semiconductor laser element 10 according to any one of claims 4 to 6, wherein the first electrode is formed in contact with the surface of the waveguide region so as to cover a part of the embedded insulation film, a pad electrode is formed in contact with the first electrode so as to cover a part 15 of the protective insulation film, and the insulative region for reducing the capacitance of the element includes a region below the embedded insulation film.

8. The nitride semiconductor laser element according to any one of claims 4 to 6, wherein the 20 first electrode is formed in contact with the surface of the waveguide region so as to cover a part of the embedded insulation film, a pad electrode is formed in contact with the first electrode so as to cover a part 25 of the protective insulation film, and the insulation region for reducing the capacitance of the element includes at least the first electrode or a region below the pad electrode.

9. The nitride semiconductor laser element according to any one of claims 1 to 8, wherein the semiconductor laser element is a laser element for emitting bluish-purple light, and has responsiveness to  
5 input of pulse drive current of 1 ns or less.

10. A nitride semiconductor laser element characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type,  
10 which are stacked one upon the other and each comprises a nitride; a striped waveguide region of a laser light provided on the semiconductor layer of the second conductivity type; and an insulative region having a withstand voltage of 10V or more at a region other than  
15 the waveguide region in the semiconductor of the second conductivity type.

11. A nitride semiconductor laser element characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type being  
20 different from the first conductivity type, which are stacked on a main surface of a substrate and each comprises a nitride; and a striped waveguide region for a laser light provided on the semiconductor layer of the second conductivity type, wherein at least a part  
25 of the semiconductor layer of the second conductivity type serves as a region for reducing the capacitance of

the element by being converted into the first conductivity type in a direction of thickness at a peripheral region remote from the waveguide region.

12. The nitride semiconductor laser element  
5 according to claim 11, having an npn structure in the peripheral region remote from the waveguide region, wherein the semiconductor layer of the first conductivity type is an n-type semiconductor layer, and the semiconductor layer of the second conductivity type  
10 is a p-type semiconductor layer.

13. The nitride semiconductor laser element  
according to claim 11, having a pnpn structure in the peripheral region remote from the waveguide region, wherein the semiconductor layer of the first conductivity type is an n-type semiconductor layer, and the semiconductor layer of the second conductivity type  
15 is a p-type semiconductor layer.

14. A bluish-purple light emitting laser element  
characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type,  
20 which are stacked one upon the other and each comprises a nitride; and a striped waveguide region of a laser light provided on the semiconductor layer of the second conductivity type, wherein the element comprises an insulation region for reducing the capacitance of the  
25 element in a peripheral region remote from the

waveguide region, and wherein responsiveness of the element with respect to input of a pulse drive current is 1 ns or less.